REMARKS

In the Office Action, the Examiner objected to the specification because a small, lower-case superscripted letter 't' is present in the upper matrix operation illustrated on page 12. The Examiner objected to the drawings because previously amended Figure 3 did not correct the problem cited - element 401 is still labeled 'PRIM' because the annotated drawing sheet replacement for Figure 3 is informal because it contains markings and handwriting.

The Examiner rejected claims 1 and 2 under 35 U.S.C. § 103(a) as being unpatentable over Negishi et al. (U.S. Patent No. 6,005,590) ("*Negishi*"); rejected claims 3 and 4 under 35 U.S.C. § 103(a) as being unpatentable over *Negishi* in view Inoue et al. (U.S. Patent No. 5,982,380) ("*Inoue*"); rejected claims 5-8, 11, and 12 under 35 U.S.C. § 103(a) as being unpatentable over *Negishi* in view *Inoue* and further in view of Koss et al. (U.S. Patent No. 5,720,019) ("*Koss*"); and rejected claims 9 and 10 under 35 U.S.C. § 103(a) as being unpatentable over *Negishi* in view *Inoue* in view of *Koss* and further in view of Oliver et al. (U.S. Patent No. 5,313,610) ("*Oliver*").[1]

Claim 5 has been amended to correct typographical errors. Claims 1-12 remain pending. Applicants respectfully request reconsideration of the Application in light of the following remarks.

Applicants have amended the equation on page 12 to read $^T(M_u^{-1})$ to more clearly define the function. Accordingly, Applicants respectfully request that the Examiner withdraw the objection to the specification.

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[1] The Office Action contains a number of statements reflecting characterizations of the related art and the claims. Regardless of whether any such statement is identified herein, Applicants decline to automatically subscribe to any statement or characterization in the Office Action.

Applicants attach a replacement drawing for Figure 3, indicating that element 401 is labeled PROM. Accordingly, Applicants respectfully request that the Examiner approve the replacement drawing and withdraw the objection to the drawings.

Applicants respectfully traverse the rejection of claims 1 and 2 under 35 U.S.C. § 103(a). The prior art cited by the Examiner, *Negishi*, does not teach or suggest each and every element of claims 1 and 2. A *prima facie* case of obviousness has, therefore, not been established.

Claim 1 recites a combination including, for example:

> a clip code generation circuit for generating clip codes obtained by setting data in accordance with results of a comparison of coordinates of said vertices and a judgment reference value of said multi-dimensional region and a negative value of the judgment reference value as bit data

(emphasis added). *Negishi* does not teach or suggest at least these elements. Instead, *Neghishi* teaches, "a clip code indicates if an object is positioned inside or outside a clip space of a rectangular parallelopiped which is defined by clip frames of six chip plates (X=XMAX, X=XMIN, Y=YMAX, Y=YMIN, Z=ZMAX, Z=ZMIN)" (column 7, line 67 - column 8, line 4). These six clip plates refer to a predetermined coordinate system, as shown in Fig. 4, that is used as a clip space. The analysis in *Negishi* only determines when a vertex of an object (triangles in Fig. 4) is positioned inside this clip space.

In contrast, claim 1 requires a "judgment reference value of said multi-dimensional region and a negative value of the judgment reference value" in addition to results of a comparison of said vertices which are expressed by a predetermined coordinate system. *Negishi* is silent to the use of such a judgment reference value of

said multi-dimensional region and a negative value of the judgment reference value. *Negishi* only uses the MIN and MAX values to define a rectangular parallelopiped. Once this rectangular parallelopiped is obtained, there is no teaching in *Negishi* that "judgment reference value of said multi-dimensional region and a negative value of the judgment reference value" are used in the generation of the clip code.

The Examiner admits that *Negishi* does not state "that the vertex is compared with both the judgment value and a negative judgment value." The Examiner, however, continues, "one of ordinary skill in the art would appreciate that the judgment values merely define the bounding region of the two- or three-dimensional region or volume, and that if the coordinate system were normalized so that the zero value and/or origin was situation within the clipping region or volume" (Office Action on page 6-7). The Examiner seems to be stating that normalizing the coordinate system could result in a negative and positive MIN and MAX values. That statement is not correct, however, because normalizing the coordinate system would not inherently produce a judgment value and a negative judgment value. Instead, the only coordinate system taught in *Negishi* is the one that is used to create the predetermined coordinate system and subsequent vertices. Therefore, only this predetermined coordinate system could be normalized.

Even assuming, absent any teaching in *Negishi*, that the MIN and MAX values for the x-, y-, and z-coordinates correspond to a judgment reference value and a negative value of the judgment reference value, which they cannot, there is no teaching that these two values are related in any way other than one is smaller than the other.

Negishi thus does not teach a "judgment reference value of said multi-dimensional region and a negative value of the judgment reference value" as required in claim 1.

Because the cited reference fails to teach or suggest the subject matter of claim 1 and dependent claim 2, no *prima facie* case of obviousness has been established with respect to these claims. Applicants therefore respectfully request the Examiner to withdraw the rejection of claims 1 and 2 under 35 U.S.C. § 103(a) as being unpatentable over *Negishi*.

Applicants respectfully traverse the rejection of claims 3 and 4 under 35 U.S.C. § 103(a).

Claim 3 depends from claim 1 and claim 4 depends from claim 2 and therefore include all of the elements recited therein. The Examiner relies on *Inoue* for allegedly teaching a "clip code generation circuit (that) generates said clip codes based on code data obtained by subtracting an absolute value of said judgment reference value from the absolute value of said vertex coordinates, code data of said vertex coordinates, and code data of said judgment reference value" as required by claims 3 and 4. Even assuming this assertion is true, *Inoue* fails to cure the deficiencies of *Negishi* discussed above.

Inoue teaches taking a case of a rectangular-solid view volume as an example. Figures 15 and 16 show a view volume constituted of six planes of x=-1, x=1, y=-1, y=1, z=-1, and z=1 (column 1, lines 36-39). Using a triangle having three vertices V0, V1, and V2, the coordinate of each vertex is compared with the values representing the six planes (column 1, lines 21-25 and 40-42). These coordinates represent a

predetermined coordinate system. They do not represent "a multi-dimensional region of an <u>object</u> to be drawn" as required by claim 1.

Inoue is concerned with whether a <u>vertex of an object</u> to be drawn is within the view volume. However, claim 1 requires "a judgment reference value of said multi-dimensional region and a negative value of the judgment reference value", and these reference values are used in combination with a predetermined coordinate system to determine if "<u>vertices expressed by a predetermined coordinate system are inside or outside a multi-dimensional region of an object to be drawn</u>". *Inoue* determines if a vertex of an object is within a volume, not if vertices are inside or outside of a multi-dimensional region of an object to be drawn.

Because *Negishi* in view of *Inoue* fail to teach or suggest the subject matter of claim 1 and dependent claims 2-4, no *prima facie* case of obviousness has been established with respect to these claims. Applicants therefore respectfully request the Examiner to withdraw the rejection of claims 3 and 4 under 35 U.S.C. § 103(a) as being unpatentable over *Negishi* in view of *Inoue*.

Applicants respectfully traverse the rejection of claims 5-8, 11, and 12 under 35 U.S.C. § 103(a).

A *prima facie* case of obviousness has not been established because, among other things, *Negishi* in view of *Inoue* and further in view of *Koss* does not teach or suggest each and every element of Applicants' claims.

Claim 5 recites a combination including, for example:

> a clip code generation circuit for generating clip codes obtained by setting data <u>in accordance with results of a comparison of coordinates of said vertices and a judgment reference value of said multi-dimensional</u>

region and a negative value of the judgment reference value as bit data for
the amount of the vertices of the primitive;

...

clip registers of at least a number smaller than the number of said
vertices of said primitive by one cascade connected to an output of said
current clip register and able to replace the held data with the clip codes
held by the register of a previous stage in accordance with a control signal

(emphasis added). *Negishi* in view of *Inoue* and further in view of *Koss* does not

teach or suggest at least these elements.

As stated above, *Negishi* in view of *Inoue* do not teach a "judgment reference

value of said multi-dimensional region and a negative value of the judgment reference

value." *Koss* is directed to a graphic processing circuit for use in a graphics accelerator

(column 2, lines 9-11). *Koss* does not teach or suggest "setting data in accordance with

results of a comparison of coordinates of said vertices and a judgment reference value

of said multi-dimensional region and a negative value of the judgment reference value

as bit data for the amount of the vertices of the primitive."

The Examiner relies on *Koss* for allegedly teaching "clip registers of at least a

number smaller than the number of said vertices of said primitive by one cascade" as

required by claim 5. The Examiner states that *Koss* depicts a cascade connection in

Figure 4 with the cascade connection stated in column 9, lines 51-57. Column 9, lines

51-57 teach a shift register storage element 229 that comprises six single bit memory

cells (232, 234, 236, 238, 240, and 242). There is no teaching in this passage or

anywhere else in *Koss* of a cascade.

Further, Figure 4 shows output from the first cell of shift register 249 going to the

first cell of shift register 247, then to the first cell of shift register 245, and finally to the

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first cell of the final shift register. One of ordinary skill in the art would recognize that if the output is going to the same cell in each subsequent shift register, there is no cascade. Therefore, *Koss* does not teach "clip registers of at least a number smaller than the number of said vertices of said primitive <u>by one cascade</u>" as required by claim 5.

Because the cited references fail to teach or suggest the subject matter of claim 5 and dependent claims 6-8, 11, and 12, no *prima facie* case of obviousness has been established with respect to these claims. Applicants therefore respectfully request the Examiner to withdraw the rejection of claims 5-8, 11, and 12 under 35 U.S.C. § 103(a) as being unpatentable over *Negishi* in view of *Inoue* and further in view of *Koss*.

Applicants respectfully traverse the rejection of claims 9 and 10 under 35 U.S.C. § 103(a).

Claims 9 and 10 depend from claim 5 and therefore include all of the elements recited therein. The Examiner relies on *Oliver* for allegedly teaching a control circuit that selectively initializes a desired register among a plurality of clip registers including said current clip register under predetermined conditions. Even assuming this assertion is true, *Oliver* fails to cure the deficiencies of *Negishi, Inoue*, and *Koss* discussed above. *Oliver* is directed to a direct memory access control device that uses a single bus (column 2, lines 8-15). There is no teaching, for example, of "a clip code generation circuit for generating clip codes obtained by setting data in accordance with results of a comparison of coordinates of said vertices and a judgment reference value of said multi-dimensional region and a negative value of the judgment reference value as bit data" as required by claim 5.

Because *Negishi* in view of *Inoue* in view of *Koss* and further in view of *Oliver* fail

to teach or suggest the subject matter of claim 5 and dependent claims 9 and 10, no

prima facie case of obviousness has been established with respect to these claims.

Applicants therefore respectfully request the Examiner to withdraw the rejection of

claims 9 and 10 under 35 U.S.C. § 103(a) as being unpatentable over *Negishi* in view

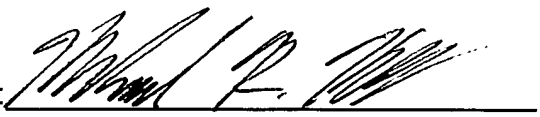of *Inoue* in view of *Koss* and further in view of *Oliver.*

In view of the foregoing amendments and remarks, Applicants respectfully

request reconsideration and reexamination of this application and the timely allowance

of the pending claims.

Please grant any extensions of time required to enter this response and charge

any additional required fees to our deposit account 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

Dated: draft   By:_____
                                              Michael R. Kelly
                                              Reg. No. 33,921

Attachments:
    (1) Replacement Drawing Sheet (2 pages);

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